

Pneumonia


Dr. Ibrahim Al-Homood

- Community-acquired pneumonia (CAP) is defined as an acute pneumonia occurring in persons who have not been hospitalized recently and are not living in facilities such as nursing homes

Risk factors

- COPD
- cardiovascular disease
- diabetes mellitus
- Smoking
- Alcoholism
- neurologic diseases that increase the risk of aspiration

Causative organism

- *Streptococcus pneumoniae*  The most common
- *Haemophilus influenzae* and *Moraxella catarrhalis* are also common pathogens.
- *Klebsiella pneumoniae* is reported in patients with alcoholism.
- *Pseudomonas aeruginosa* in patients with chronic underlying structural lung disease

- *Staphylococcus aureus*

1. when CAP occurs following influenza
2. in patients with cavitary pneumonia in whom there are no risk factors for aspiration
3. in injection drug users
4. in patients with a recent history of skin and soft tissue infection.

C/F

BOX 43-1

SYMPTOMS OF COMMUNITY-ACQUIRED PNEUMONIA

Fever or hypothermia

Rigors, sweats

New cough with or without sputum production

Hemoptysis

Change in character of respiratory secretions in a patient with chronic cough

Chest discomfort

Dyspnea

Anorexia, fatigue, or myalgias

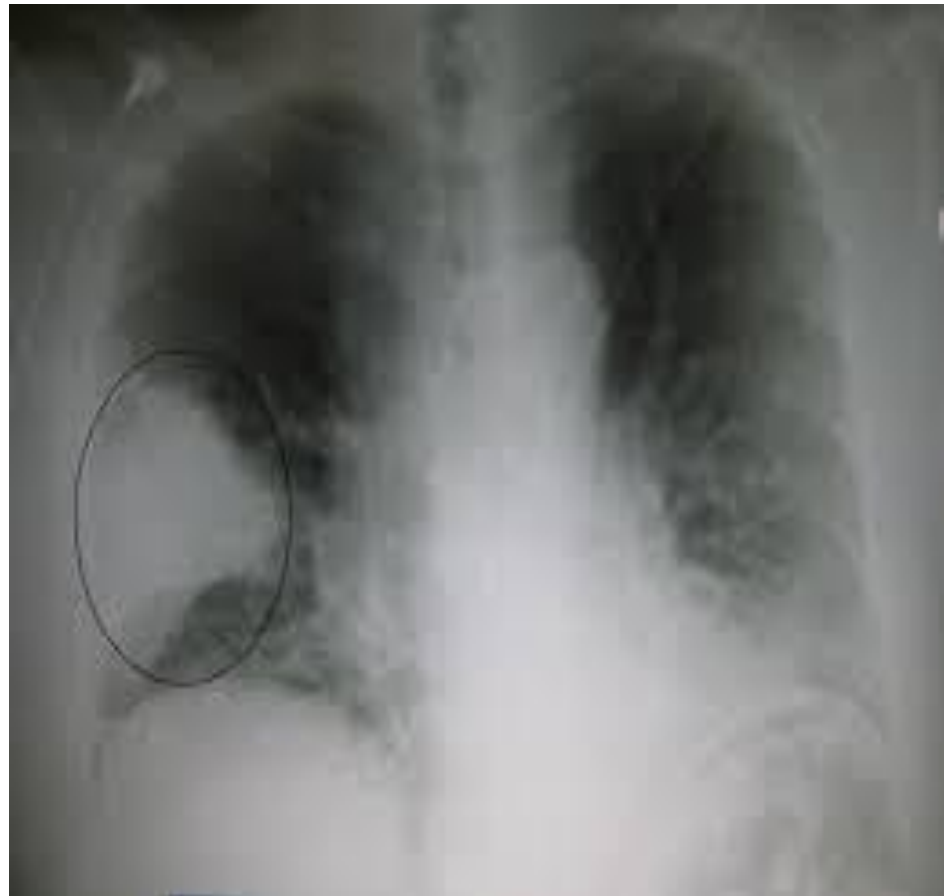
Diagnosis

- The acute onset of cough (especially with purulent sputum production), fever, chills, pleuritic chest pain, and dyspnea is characteristic of pneumonia.
- The presentation may be much more nonspecific in elderly patients.
- Tachypnea is the most sensitive finding suggesting pneumonia in elderly.

- CBC
- U&E
- **CXR**
- SPUTUM C/S
- BLOOD C/S
- Legionella antigen



?









Treatment

- Admission OR NO ???

① CURB-65

② PSI

③ IDSA/ATS

Poor prognostic factors

- ① Old age
- ② Multi-lobar
- ③ Bacteremia
- ④ Sever associated disease
- ⑤ Immunosuppression

Table 14. IDSA/ATS Minor Criteria for Severe Community-Acquired Pneumonia**Clinical Criteria**

Confusion (new-onset disorientation to person, place, or time)

Hypothermia (core temperature $<36.0^{\circ}\text{C}$ [96.8°F])Respiration rate $\geq 30/\text{min}^{\text{a}}$

Hypotension necessitating aggressive fluid resuscitation

Multilobar pulmonary infiltrates

Laboratory CriteriaArterial PO_2/FIO_2 ratio $\leq 250^{\text{a}}$ Leukopenia (<4000 cells/ μL [$4.0 \times 10^9/\text{L}$])Thrombocytopenia ($<100,000$ / μL [$10 \times 10^9/\text{L}$])Blood urea nitrogen >20 mg/dL (7.1 mmol/L) μL = microliter; IDSA/ATS = Infectious Diseases Society of America/American Thoracic Society.

- outpatient antibiotics for 5- 7 days

Table 15. Antibiotic Therapy for Community-Acquired Pneumonia in Outpatients

Risk Factors	Treatment
Previously healthy and no risk factor(s) for drug-resistant <i>Streptococcus pneumoniae</i>	Macrolide (azithromycin, clarithromycin, or erythromycin) or doxycycline
Risk factor(s) for drug-resistant <i>S. pneumoniae</i> or underlying comorbidities	Respiratory fluoroquinolone (moxifloxacin, gemifloxacin, or levofloxacin) or β -lactam ^a plus a macrolide or doxycycline

^aAmoxicillin, 1 g every 8 hours, or amoxicillin-clavulanate, 2 g every 12 hours (preferred), or cefpodoxime or cefuroxime, 500 mg twice daily (alternative).

Table 16. Empiric Antibiotic Therapy for Community-Acquired Pneumonia in Inpatients

Inpatient Setting	Treatment
Medical ward	β -lactam ^a plus a macrolide or doxycycline; or respiratory fluoroquinolone (moxifloxacin, gemifloxacin or levofloxacin)
Intensive care unit	β -lactam ^b plus either azithromycin or a fluoroquinolone ^c ; if penicillinallergic, a respiratory fluoroquinolone ^d plus aztreonam
If risk factor(s) for <i>Pseudomonas aeruginosa</i> or gram-negative rods on sputum Gram stain	Antipseudomonal β -lactam with pneumococcal coverage (cefepime, imipenem, meropenem, or piperacillin-tazobactam) plus ciprofloxacin or levofloxacin (750 mg); or antipseudomonal β -lactam with pneumococcal coverage plus an aminoglycoside plus azithromycin; or antipseudomonal ^e β -lactam with pneumococcal coverage plus an aminoglycoside plus a respiratory fluoroquinolone
If risk factor(s) for CA-MRSA or compatible sputum Gram stain	Add vancomycin or linezolid to β -lactam ^b plus either azithromycin or a fluoroquinolone ^c

CA-MRSA = community-associated methicillin-resistant *Staphylococcus aureus*.

^aCefotaxime, ceftriaxone, or ampicillin; ertapenem is an alternative in patients with an increased risk of enteric gram-negative pathogens (not *P. aeruginosa*).

^bCefotaxime, ceftriaxone, or ampicillin-sulbactam.

^cMoxifloxacin, gemifloxacin, ciprofloxacin, or levofloxacin.

^dMoxifloxacin, gemifloxacin, or levofloxacin.

^eAztreonam can be used in a patient with a severe β -lactam allergy.

When to shift to PO?

- *Clinical stability are met*
 - ① temperature ≤ 37.8 °C [100.0 °F]
 - ② PR ≤ 100 /min
 - ③ RR ≤ 24 /min
 - ④ SBP ≥ 90 mm Hg
 - ⑤ arterial oxygen saturation $\geq 90\%$ or $PO_2 \geq 60$ mm Hg [7.9 kPa]
 - ⑥ ability to tolerate oral intake
 - ⑦ normal mental status

Hospital-Acquired Pneumonia

Ventilator-Associated Pneumonia

- HAP is defined as a pneumonia that occurs 48 hours or more after hospital admission that was not incubating at the time of admission.
- VAP is defined as pneumonia that develops more than 48 hours after beginning mechanical ventilation.

Risk factors

- Old age
- Altered mental status
- Underlying chronic lung disease
- Neurologic disease
- Previous antibiotic use
- Abdominal or thoracic surgery
- Mechanical ventilation
- Recent large-volume aspiration
- Nasogastric intubation

Treatment goals

- (1) treat early
- (2) administer empiric broad-spectrum antimicrobial agents
- (3) de-escalate antimicrobial coverage when appropriate
- (4) consider short-duration therapy (7-8 days) whenever feasible.